66337 - Distributed Generation, Smartgrids and electric movility

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	535 - Master's in Renewable Energies and Energy Efficiency
ECTS	5.0
Year	1
Semester	Second semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as

- Lectures where the basic concepts are explained and related to the technical characteristics of processes using short exercises.
- Practice sessions consist on laboratory experiments and computer sessions.

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- Assignments in which the student will demonstrate the skills acquired progressively.

5.2.Learning tasks

The course includes the following learning tasks:

- A01 Lectures (25 hours). Presentation of theoretical contents by a faculty or by external experts to all students enrolled in the course. Although it is not a mandatory activity, regular attendance is highly recommended.
- A02 Problem and case solving (13 hours). Solve practical problems and exercises with all the students. Although it is not a mandatory activity, regular attendance is highly recommended.
- A03 Laboratory sessions (12 hours). Students will work actively in groups to solve practical exercises.
- A06 Guided assignments (20 hours). Students will complete assignments, problems and exercises related to concepts seen in laboratory sessions and lectures.
- A07 Autonomous work (50 hours). Students are expected to spend about 50 hours to study theory, solve problems and prepare lab sessions
- A08 Assessment (5 hours).

The indicated hours are for guidance and will be adjusted depending on the academic calendar.
At the beginning of the course, lecturers will communicate the schedule of practice sessions, which will be set according to the syllabus and the availability of laboratories and computer rooms.

5.3.Syllabus

The course will address the following topics:

1. The future of the electricity grid
2. The need for distributed generation (DG) and microgrids
3. Current Vision: The three fundamental technologies: Storage, Solar PV and Power Electronics
4. Introduction to electrical energy storage
5. Storage technologies
6. Evolution of different storage technologies and future prospects
7. Technological progress in photovoltaics applied to DG and microgrids
8. Technological progress in Power Electronics, Sensoring and Control applied to DG and microgrids
9. History of the Electric Vehicle (EV)
10. The need for EVs
11. Reduced-emissions vehicles
12. Structure of the EV
13. EV recharging systems
14. EVs in the Smart City

5.4.Course planning and calendar

Other activities will be planned depending on the number of students and will be announced in good time.

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the EINA website:
https://eina.unizar.es/estudios/index.php?option=com_content&view=article&id=85&catid=79

5.5.Bibliography and recommended resources